Title	Optimization of extraction of phenolic compounds from wheat using response surface methodology
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Abstract

The optimum conditions for the extraction of crude phenolics from whole grain and bran of soft and hard wheat were determined using response surface methodology (RSM). A face-centered cubic design (FCD) was used to investigate the effects of three independent variables, namely solvent composition (%), extraction temperature (°C) and time (min) on the response, total antioxidant activity (TAA). The independent variables were coded at three levels and their actual values selected on the basis of preliminary experimental results. The FCD consisted of 14 experimental points and three replications at the center point. Data were analyzed using design expert and statistical analysis system software. A second-order polynomial model was used for predicting the response. Regression analysis showed that more than 89% of the variation was explained by the models. Canonical analysis of surface responses revealed that the stationary surface was a saddle. The optimal conditions forthe TAA obtained using ridge analysis were 54%, 61 °C, 64 min and 49%, 64 °C, 60 min, for whole grain and bran of soft wheat, respectively. Under the optimum conditions the corresponding predicted response values for TAA were 56.5 and 63 TE. The crude phenolics were extracted under optimum conditions to check the validity of the model. The values were 54.7 ± 3.2 and 61.3 ± 1.9 TE, for whole grain and bran of soft wheat, respectively; A similar trend was observed for TAA of hard wheat. The experimental values agreed with those predicted, thus indicating suitability of the model employed and the success of RSM in optimizing the extraction conditions.